fested regions to concentrating points from which they were transshipped to Europe for military purposes may have resulted in the establishment of other foci of infestation not now known. Increased activity at this time in the shipment of horses from the infested territory for use in our own cavalry and for agricultural purposes will no doubt give every opportunity for the insect to become widely established if some natural agencies do not prevent or steps are not taken to destroy the bots before horses are shipped.

The accompanying map shows the probable present distribution of the species in the United States, and indicates the points where its presence has been observed by us or recorded by correspondents. The comparatively small number of large dots in North Dakota is explained by fewer circulars being sent there rather than by a smaller number of nose flies.

PRELIMINARY EXPERIMENTS WITH SODIUM FLUORIDE AND OTHER INSECTICIDES AGAINST BITING AND SUCKING LICE.

By F. C. Bishopp and H. P. Wood,

Bureau of Entomology, U. S. Department of Agriculture.

The very satisfactory results secured by the authors with the use of sodium fluoride against various species of biting lice (Mallophaga) on chickens and other domestic fowls[1] naturally has led to inquiry from many sources as to the effect of this compound on lice of cattle, horses, and other domestic animals. So it is thought advisable at this time to publish a few preliminary notes on the results of the use of this material and other insecticides against several species of Mallophaga and sucking lice on such hosts. A few experiments carried out during 1910 and 1912 indicated that the standard arsenical dip usually known as the B. A. I. formula (8 lbs. white arsenic, 24 lbs. sal soda, 1 gal. pine tar, to 500 gals. water) is a very effective insecticide against both the Mallophaga and Anoplura. In these tests it was found that one thorough spraying or dipping of cattle quite heavily infested with biting lice (*Trichodectes scalaris* Nitzsch), and the short-nosed ox louse (*Hæmatopinus eurysternus* Nitzsch) completely destroyed them in two treatments at weekly intervals. It was not ascertained, however, if one application would be sufficient.

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[1] See Farmers' Bulletin No. 801.

More recent work included tests of a considerable number of insecticides. The results of the early tests with arsenical solution were completely borne out and it appeared that all forms of both the biting louse (*T. scalaris*) and the long-nosed ox louse (*Linognathus vituli* L.) were destroyed with one dipping. In one experiment with arsenical solution of one-half the normal strength both adults, larvæ, and eggs of *T. scalaris* were destroyed. The use of this strength against the long-nosed ox louse did not accomplish complete destruction. The action of the arsenical solution against the biting lice was quite prompt, but the sucking lice were killed more slowly, as in the case of ticks.

All of our tests prove that the biting lice are quite susceptible to the action of caustic or poisonous substances. They seem to be killed uniformly more easily and quickly than the sucking species. In a series of experiments against the biting lice of cattle the following substances were used in addition to arsenical dip: Kerosene emulsion (2 gals. kerosene, ½ lb. laundry soap, 1 gal. water, reduced 1 to 8 and 1 to 12); flowers of sulphur (½ lb. per animal); 40 per cent. nicotine sulphate (1 to 800); soap and water (1 oz. per gal.); sodium fluoride (commercial, 90 to 98 per cent.) as dust and dip. All of these substances, with the exception of the soap and water, killed all stages. The soap and water destroyed everything but the eggs, which hatched successfully.

The sodium fluoride (97 to 98 per cent.) was used as a spray at the rate of one ounce and also one-half ounce per gallon. In both of these strengths all stages were promptly destroyed. When applied as a dust the material was put on with flour in the proportion of one ounce to five ounces of flour, six ounces of this mixture being used on a yearling. Three ounces of sodium fluoride were applied to an animal with a shaker and the material worked into the hair, and in another test one ounce was applied with a bellows dust gun. In each of these tests the destruction was complete.

A number of experiments were also conducted with the use of sodium fluoride against the biting dog louse (*Trichodectes latus* Nitzsch). Some of the animals treated were very heavily infested and covered with sores evidently caused by the presence of the lice. In some tests the material was applied by hand with a dust can, about one ounce being used to each animal, and in others it was applied as a dip, the sodium fluoride being dissolved in water at the rate of one ounce to the gallon. In all of these tests the destruction was complete and the lesions promptly healed.

Experiments conducted thus far with sodium fluoride clearly show its efficacy in the case of Mallophaga on domestic animals. Owing to the comparatively high price of the substance (about 50 cents per pound) it is inadvisable to recommend its use in the form of a dip for large animals as other equally effective dips which are much cheaper may be used. The tests indicate, however, that the substance may be very useful for the winter treatment of animals, especially in the northern states where dipping during the cold weather is impractical. Attention also should be called to the fact that infestations are normally heaviest during the winter and spring months, just at a time when the practice of dipping might be dangerous. The application of sodium fluoride with a dust gun is not laborious, and since it appears that only about one ounce of material per animal is necessary the treatment would not be expensive. Our preliminary tests also indicate that if all animals in a herd are treated at one time in this way, one application will be sufficient. Although we have found that lice may live from 7 to 15 days when removed from the host it appears that under usual circumstances sodium fluoride is retained in the hair for sufficient length of time to destroy any lice which may happen to return to the host.

While there appears to be some possibilities in the use of sodium fluoride against sucking lice the experiments thus far conducted indicate that it can not be relied upon for use against any of the members of this order.

GEOMETRID NOTES.

By L. W. Swett,
Boston, Mass.

I am convinced, after a careful study of the genitalia, that the American form of Eucymatoge, now listed as *Horisme vitalbata*, D. & S., is distinct from the European. I have received a number of specimens, of the American form of *vitalbata* through Mr. Wolley Dod from Calgary, Alberta, and of the European through Dr. Bastelberger and I can find only very slight external differences. The American form of *vitalbata* seems to have the yellow band of primaries, more of a grayish cast, where the European is a deep yellow. Also the band of the primaries seems narrower than the European and at the apex is more clouded. It is very hard to draw any definite characters for separating them except on the genitalia which prove most distinct and so would list the American form as a race, if not later may turn out to be a good species.

Horisme vitalbata D. & S. var. **incana** nov.

The valvæ are narrower and longer than the European *vitalbata* and the sacculus is most distinct, being bifurcate at tip. It resembles slightly the shape of a boy's mitten, with the thumb projecting at an angle. In the European *vitalbata* this process is rounded with but a single jointed projection. Also the penis of the American form is thicker than the European and the œdeagus is spined in the middle, which is lacking in *vitalbata*. The tip of the penis is bulbous with short spines apparently knobbed at the base, and the vesica has wide and long cornuti. The saccus is broad and rounded. The ductus bursa of the female genitalia has three elongated patches from which long stout spines protrude. At the junction of the neck or ductus bursa and the bag or bursa there is a row of very stout spines projecting at all angles. The bursa is instrate or covered with fine spines not heavy and thick as in *vitalbata*. The edge of the bursa in *vitalbata* is surrounded with heavy spines, where in *incana* they are not any thicker than in the other sections. The true *vitalbata* D. & S. may possibly occur in North America as our material at present is so limited, so I have listed the American form as a race until we know more about the life-histories. It is evident from my study of the genitalia that we need large series of specimens, field notes and life-histories before we can list forms, races or species on our present scanty knowledge, as at present it is more or less individual opinion. I have made the male, from which I prepared my best slide, as the type, in case the true *vitalbata* D. & S. should occur in North America.

Expanse 27–29 mm.

Holotype ♂ — VI — 5, 1914, Calgary, Alberta, from Mr. Wolley Dod.

Allotype ♀ — VI — 26, 1907, Calgary, Alberta, from Mr. Wolley Dod.

Paratype ♀ — VI — 26, 1914, Calgary, Alberta, from Mr. Wolley Dod.

All the above are in my collection.

NOTE ON THE ICHNEUMONID GENERA CYANOCRYPTUS AND LAMPROCRYPTUS.

By Charles T. Brues.

When collecting insects in the Peruvian Andes several years ago, I secured a large metallic blue Ichneumonid which proves to be the female of *Cyanocryptus metallicus*, a species described by Cameron in 1903 from a male specimen collected in Ecuador. Since then I have received through Dr. F. E. Lutz of the American Museum of Natural History a quite similar insect from Southern Patagonia apparently referable to Cameron's genus Lamprocryptus, which can hardly be separated from Cyanocryptus.

Since the female of *Cyanocryptus metallicus* has not been described and as there is some confusion concerning the name Lamprocryptus, the following note is presented.

Cyanocryptus Cameron.

The Entomologist, Vol. 36, p. 121 (1903).
Schmiedeknecht, Opus. Ichneum., fasc. VI, p. 415 (1904).
Schmiedeknecht, Gen. Insect., fasc. 75, p. 13 (1909).

Type: *C. metallicus* Cameron.

Cyanocryptus metallicus Cameron

The Entomologist, Vol. 36, p. 121 (1903) (♂).

Female. Length 19 mm., ovipositor 10 mm. Brilliant metallic blue; head and thorax with purplish reflections, especially on the cheeks and propodeum; first two segments of abdomen strongly purplish; remaining ones bluish; antennæ black with a white annulus from the middle of the second flagellar joint to the tip of the ninth, the second and basal half of the third black above. Tarsi, palpi, mandibles, and ovipositor with its sheaths black; four anterior tibiæ dark brown, with but little metallic color. Wings black, with brilliant blue and purple reflections. Antennæ slender, tapering; first flagellar joint four times as long as thick; second and third but little shorter; fourth half as long as the first, fifth and sixth each slightly shorter. Propodeum coarsely reticulated, with well developed, but not large lateral teeth; without complete transverse carinæ, but with the anterior one indicated medially as a short curved ridge bent forward at the middle where it is contiguous to a very small basal area. Abdomen shining, microscopically roughened and punctulate but not sufficiently so to render its surface opaque. Transverse median vein almost interstitial with the basal vein, the submedian cell barely longer.

Aside from the position of the transverse median vein which Cameron describes as "not interstitial" and the abdomen which is "shining, impunctate" in the male there are no conspicuous differences between the sexes. The female I took near Matucana, Peru at an altitude of 7,500 feet. The male type from Ecuador was taken at between 7,000 and 8,000 feet altitude. This insect is evidently common in the Peruvian Andes as I saw numerous specimens in Professor Townsend's collection taken by him in the same part of Peru.

LAMPROCRYPTUS SCHMIEDEKNECHT.

Opusc. Ichneum., fasc. VI, p. 414 (1904) (no species).

Schmiedeknecht, Gen. Insect. fasc. 75, p. 11, pl. 1, fig. 7, pl. II, fig. 5 (1908) (six species described).

Viereck, Bull. U. S. Nat. Mus., No. 83, p. 81 (type species designated).

Type: *L. gracilis* Schmiedeknecht.

LAMPROCRYPTUS CAMERON.

Trans. Amer. Ent. Soc., Vol. 35, p. 435 (1909).

Type: *L. kinbergi* Holmgren.

Schmiedeknecht first used the name in 1904 in his Opuscula Ichneumonologica without designating any type. In the Genera Insectorum (1909) he again lists "Lamprocryptus nov. gen." and describes six species, one of which has been designated as the genotype by Viereck who dates the genus from 1904.

Cameron used the name in December 1909 and refers to the generic key in Schmiedeknecht's 1904 paper, but through a peculiar *lapsus* attaches the name Lamprocryptus to his new genus. As Cameron's genus hardly seems distinct from Cyanocryptus it appears unnecessary at the present time to propose a new name.

Several South American species, including the new one described below, may be tentatively placed in Cyanocryptus, as follows.

C. metallicus Cameron (type). Entomologist, Vol. 36, p. 122 (1903). Ecudoris Peru.

C. kinbergi Holmgren (type of Lamprocryptus Cameron). Eugenias Resa, Ins., p. 397 (1868) Argentina.

C. chalybeus Tasch. Zeits. f. d. ges. Naturw., Vol. 48, p. 63 (1876) Argentina.

C. sericeus Tasch. *Ibid. l. c.* Argentina.

C. fulgidus sp. nov. South Patagonia.

Cyanocryptus fulgidus sp. nov.

Female.- Length 11 mm., ovipositor 6 mm. Brilliant metallic blue with violaceous reflections, the latter most noticeable on the head, upper surface of thorax and on the first three segments of abdomen; antennæ black, without annulus; hind femora and tibiæ bright ferruginous; front femora beneath and their tibiæ entirely ferruginous; middle tibiæ dull ferruginous; all tarsi black, the trochanters and the four anterior femora with the metallic reflections much less pronounced than on the body. Wings deeply infuscated, but not black. Head seen from above strongly emarginate both on the front and the occiput, the paired ocelli widely separated, farther from one another than from the eye margin. Face strongly convex medially, with a sharp depression on each side next to the eye below the insertion of the antenna, face rather finely and closely striato-punctate medially, more sparsely and coarsely punctate laterally; clypeus strongly convex, with a few large punctures; front reticulate medially to the ocelli, on the sides smooth and almost impunctate as are also the back of head and cheeks. Malar space one-third as long as the eye, not grooved, but with finely sculptured band from the eye to the mandible. Antennæ 50-jointed, slender and tapering, not distinctly thickened medially; first, second and third flagellar joints gradually shorter, the third three times as long as thick and as long as the two following together; following all distinctly wider than long. Mesonotum polished, with a few scattered punctures on the anterior half, those on the median lobe closer together and elongated to form a semi-striate sculpture; parapsidal furrows strong on anterior half, entirely absent behind. Scutellum strongly convex, with a deep impression at base that is bounded by high lateral carinæ and bears a series of square foveæ at its bottom. Propodeum coarsely irregularly rugose-reticulate, with large flattened teeth at the posterior angles; anterior transverse carina very weak, but complete; posterior slope deeply concave, the concavity extending above the lateral spines; viewed from the side the declivity is almost as long as the dorsal surface and nearly perpendicular. Propleuræ almost smooth at top, elsewhere coarsely more or less horizontally wrinkled; mesopleura with a shining callosity at its upper posterior angle and a series of oblique wrinkles along the posterior edge, elsewhere irregularly rugose-reticulate, as are also the metapleuræ and sides of the propodeum. Abdomen entirely smooth, impunctate and without trace of aciculations or other fine sculpture. Petiole sharply bent, strongly expanded at tip, with a complete carina passing through the spiracles and a large crescentic impression above each spiracle. Second segment with a curved impressed line on each side below the spiracle and a less distinct one passing through the spiracle. Tarsi and middle tibiæ strongly spinulose. Areolet large, its sides weakly convergent above; radial cell short and narrow; submedian cell barely shorter than the median; discocubital vein simple; cubital vein entirely wanting beyond the areolet, transverse median vein in hind wing broken near lower third.

Type: South Patagonia, B. Brown; in the American Museum of Natural History.

The following key will serve to separate the species of this group:

1. Antennæ annulate with white 2
   Antennæ not annulate . . . . *fulgidus* sp. nov.
2. Legs entirely black . . . . *metallicus* Cam.
   Legs partly ferruginous or rufous 3
3. Abdomen minutely transversely aciculate 4
   Abdomen polished, without any sculpture . . *chalybeus* Tasch.
4. "Thorax rugulose-granulate, mesonotum and scutellum smoother" . . . . *kinbergi* Holm.
   "Mesonotum densely, somewhat longitudinally, striate punctate" . . . . *sericeus* Tasch.

NOTE ON THE ADULT HABITS OF SOME HYMENOPTEROUS EGG-PARASITES OF ORTHOPTERA AND MANTOIDEA.

By Charles T. Brues,

Bussey Institution, Harvard University.

In a recent number of the *Bulletin de la Société Entomologique de France*[1] Dr. Ét. Rabaud has called attention to an omission in a recent paper of my own,[2] in which I failed to cite some observations of similar nature by French naturalists. In this paper I described an Indian Scelionid which attaches itself to the body of a locust and suggested that it probably had adopted this method of finding the eggs of locusts, upon which members of allied genera are known to be parasitic.

As Dr. Rabaud has assumed a rather critical attitude, I think it worth while to review the matter briefly. In the first place I must admit that I was unfamiliar with the observations of Xambeu at the time of writing my previous note, although they were soon afterward called to my attention by Mr. Nathan Banks who cited them some years ago.[3] In the same paper, Banks gives another reference[1] that was missed by both Dr. Rabaud and myself, in which a locust (*Dichromorpha viridis*) was found by W. V. Warner bearing adults of a species of Scelio.

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[1] 1917, No. 10, p. 178, May 1917.

[2] Adult Hymenopterous Parasites Attached to the Body of their Host. Proc. Nat. Acad. Sci., Vol. 3, pp. 136–140, Feb. 1917.

[3] Entom. News, Vol. 22, p. 195, 1911

Rabaud unfortunately refers to the Lepidoscelio which I described (*loc. cit.*) as a Chalcidid. It is a member of the Scelionidæ, belonging to the Serphoidea (*Proctotrypoidea*), an entirely different group of Hymenoptera, although the work of Xambeu, Giard, and Bordage is correctly stated as relating to Chalcidids. This phenomenon of phoresy thus appears in members of both the Chalcidoidea and Serphoidea. Rabaud is also wrong in thinking that I put forth as new either the fact that adult Scelionids attach themselves to Orthoptera, or the hypothesis that they locate the eggs of the host in this way. On page 137 of my paper I have quoted both the fact and the hypothesis as previously published by Ashmead in 1893: the text is absolutely clear on this point.

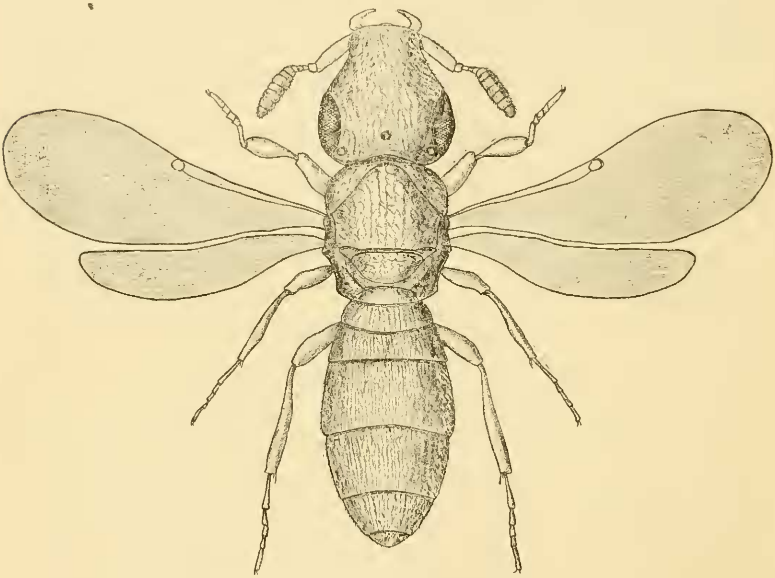

Fig. 1. *Lepidoscelio viatrix* Brues.

As the tiny species which has caused so much discussion has not before been figured I take this opportunity to add a drawing of it kindly made by Mrs. Brues.

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[1] Proc. Ent. Soc. Washington, Vol 5, pp. 308-309.

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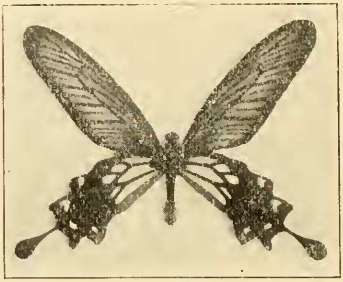

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